

Alaska Department of Fish and Game
Division of Wildlife Conservation
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Identifying and Evaluating Techniques for Wildlife Habitat Enhancement in Interior Alaska

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**Research Performance Report
Federal Aid in Wildlife Restoration
1 July 2000–30 June 2001
Grant W-27-4, Study 5.0**

This is a progress report on continuing research. Information may be refined at a later date.

If using information from this report, please credit the author(s) and the Alaska Department of Fish and Game. The reference may include the following: Haggstrom, D.A. and T.F. Paragi. 2001. Identifying and evaluating techniques for wildlife habitat enhancement in Interior Alaska, 1 July 2000–30 June 2001. Alaska Department of Fish and Game. Federal aid in wildlife restoration research performance report, grant W-27-4, study 5.0. Juneau, Alaska. 7 pp.

FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

PROJECT TITLE: Identifying and evaluating techniques for wildlife habitat enhancement in Interior Alaska

AUTHORS: Dale A Haggstrom and Thomas F Paragi

COOPERATORS: None.

GRANT AND SEGMENT NR.: W-27-4

PROJECT NR.: 5.0

SEGMENT PERIOD: 1 July 2000–30 June 2001

STATE: Alaska

WORK LOCATION: Various locations within ADF&G/DWC Region III

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Work with state and federal agencies and the private sector to plan, coordinate, and implement forest management activities to maintain or improve wildlife habitat.

Planning, coordination, and implementation of forest management activities that are the basis for this research project are currently funded under Study 20.0, *Alaska Wildlife Habitat Enhancement*. See Study 20.0 for a summary of progress made toward achieving this objective.

OBJECTIVE 2: Encourage prescribed burning and other appropriate forestry practices in developed areas to offset the negative ecological effects of increased suppression of natural fires.

Our comments the Alaska Department of Natural Resources, Division of Forestry (DOF), timber sales and schedules, and recommendations for forestry practices to benefit wildlife, were previously reported under Study 20.0, *Alaska Wildlife Habitat Enhancement*. These activities will now be funded and reported under Study 5.0.

We initiated a fire advocacy program in Fairbanks and the surrounding communities during spring 2001 to inform the public and various interest groups of the need for prescribed burning, particularly on the Tanana Flats.

We continued to give presentations on boreal forest succession and disturbance on request at local schools, the University of Alaska-Fairbanks (UAF), and other venues.

We continued to provide comments on Forest Land Use Plans and the 5-year Schedule of Timber Sales for proposed timber sales to the DOF through the Alaska Department of Fish and Game (ADF&G), Division of Habitat and Restoration.

OBJECTIVE 3: Evaluate biological and economic efficacy of prescribed burning and other forestry practices for maintaining or enhancing wildlife habitat.

Tom Paragi was hired in August 1999 to, in part: (a) evaluate whether the habitat enhancement projects implemented since 1996 under Study 20.0, *Alaska Wildlife Habitat Enhancement*, are meeting management objectives; (b) develop cost-effective ways for area office staff to evaluate habitat enhancement projects; and (c) evaluate the biological and economic efficacy of various habitat enhancement techniques.

Biological efficacy of habitat treatments is obtained by monitoring the response of vegetation and the subsequent animal use or population response, relative to objectives set forth in the treatment prescription. Cost per acre for various treatments is provided in Haggstrom and Paragi (2000). The economic efficacy of treatments, which incorporates both cost and biological response, will be addressed in subsequent reporting periods as information on vegetation and animal responses is gained.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Develop operational knowledge necessary to conduct habitat enhancement projects and monitor effectiveness in meeting management objectives.

We conducted literature reviews on regenerating aspen by prescribed fire and mechanical treatments; sampling stem density in shrub communities; sampling volume and vertical structure of coarse woody debris; monitoring habitat use by furbearers and their prey through track counts in winter; and estimating relative abundance of forest grouse. A ProCite® database on this literature will be developed in autumn 2001 with the aid of a college intern to facilitate searching and access by other agency biologists.

Through the help of the senior biologist for the Ruffed Grouse Society (RGS), we also began contacting several biologists in the upper Midwest about their experience with mechanical (non-harvest) treatments in aspen (*Populus tremuloides*) before the pulp market had developed in that region. The major questions we asked were about sprouting success with shearblading and felling, persistence of felling debris, and brood production on sites where debris might afford cover for terrestrial predators of grouse.

JOB 2: Plan, design and conduct habitat management projects to maintain, enhance, or restore wildlife populations.

This job was funded and reported under Study 20.0, *Alaska Wildlife Habitat Enhancement*, during FY01. See Study 20.0 for a summary of work completed during this period.

JOB 3: Design and conduct long-term studies to evaluate the effectiveness of different habitat management techniques and applications.

Vegetation response on stand-scale habitat treatments.

We established permanent sampling plots (1 × 5 m) for long-term monitoring of aspen burning and felling treatments at the Nenana Ridge and Two Rivers ruffed grouse project areas near Fairbanks. Data on stem density and the covariates slope, aspect, density class of debris (felling units only), proportion of adjacent trees killed (burn units only), and herbaceous community composition were collected at the end of the second growing season after disturbance.

Felled aspen were skidded into windrows on 16 of 30 acres in one experimental treatment at the Nenana Ridge ruffed grouse project area. We buried soil temperature probes in cleared areas and in windrows to test for differences in soil temperature for correlation to aspen sprouting density.

We established permanent plots and collected data on aspen regeneration at the feller-buncher treatment site at the Delta Junction ruffed grouse project area. A 10 m × 10 m enclosure 2 m tall was constructed from welded wire livestock fencing to monitor aspen stem density and growth in the absence of browsing by snowshoe hares (*Lepus americanus*) and moose (*Alces alces*). At the nearby shearblading treatment site, we drove metal stakes for permanent plots and buried recording temperature probes so that differences in soil temperature and aspen sprouting between cleared areas and debris windrows can be tested.

We wrote a study plan to evaluate three techniques for post-logging site preparation to stimulate browse and cover regeneration at a proposed 880-acre timber sale (NC-837-T) in white spruce (*Picea glauca*) along the Tok River, adjacent to the Glenn Highway. We collected pre-treatment data on moose pellet density, browse stem density, vertical and horizontal cover, and depth to permafrost in 12 of 51 proposed harvest units. Three units will be controls and three each will be treated with broadcast burning, disk trenching, and blade scarification. We also paint-marked snags, cavity trees, and large logs on several additional harvest units to remain as passerine, microtine, and furbearer habitat.

We estimated survival of fletleaf willow (*Salix alaxensis*) in timber sale NC-1085-F, located in the Standard Creek timber harvest unit near Fairbanks. Willow stems had been planted on a grid pattern in timber sale NC-1085-F in mid-July 1997 and 1998 following broadcast burning of logging slash on 25 July 1996.

Vegetation response on landscape-scale habitat treatments.

We began researching the use of color infrared (CIR) photography to estimate landscape-scale changes in vegetation cover type after the 1998 and 1999 prescribed burns done near Tok. Testing of film exposures and filter combinations for a new CIR film developed by Kodak® will be done in autumn 2001 by ADF&G. We will develop a Reimbursable Services Agreement with DOF staff experienced in computer-based Geographic Information Systems (GIS) to import the scanned photos into a GIS, merge imagery with a digital elevation model for enhanced resolution, and compare the post-fire imagery with pre-fire CIR imagery already in their GIS database.

JOB 4: Design and conduct long-term studies to determine the response of wildlife populations to habitat treatments.

Wildlife response to stand-scale habitat treatments.

We established line transects for winter track surveys of furbearers, gallinaceous birds, snowshoe hares, and moose at the Nenana Ridge ruffed grouse project area and along the Tok River in the proposed timber sale NC-837-T. Track intersect counts were conducted along the pre-established transects when suitable conditions occurred after a snowfall. Data from multiple counts per winter over several winters will allow statistical comparison of intersection rates, corrected for time since snowfall, among habitat types or treatments.

Wildlife response to landscape-scale habitat treatments.

Spring drumming surveys for males, late summer brood surveys with trained dogs, and a kiosk with hunter reporting cards were established to index changes in relative abundance of ruffed grouse at Nenana Ridge.

We cooperated with the Alaska Bird Observatory to have their staff conduct preharvest passerine surveys at the proposed timber sale NC-837-T near Tok to possibly detect the influence of timber harvest on songbird abundance or habitat use.

We assisted with some of the standard moose censuses done for survey & inventory reporting (funded and reported elsewhere). These surveys have the necessary spatial resolution to infer changes in population composition, abundance, and habitat selection in early winter following prescribed burning or wildland fire.

JOB 5: Facilitate greater and more effective use of prescribed burning and other appropriate forestry practices by other state and federal agencies and the private sector, and the subsequent use of cost-effective and appropriate monitoring techniques to evaluate progress toward meeting management objectives.

We reviewed and commented on the DOF 5-year Schedule of Timber Sales and Forest Land Use Plans for the Fairbanks, Delta, and Tok areas.

We met with natural resources staff at Clear Air Force Base near Anderson to discuss options for maintaining aspen clones as wildlife habitat and facilitate their efforts to

prepare a budget request and an environmental assessment. Shearblading was presented as an immediate means to produce young aspen forest that could act as a fuel break for future use of prescribed fire to more effectively remove the black spruce understory and reduce the risk of wildland fire spreading into the developed area.

In 2001, DWC and DOF jointly purchased an aerial ignition dispenser for use by DOF on prescribed burns or for shaping fire perimeters in managing wildland fires. The purchase increases DOF's ability to enhance wildlife habitat through prescribed fire and reduces its reliance on equipment borrowed from federal agencies during the fire season.

JOB 6: Involve and inform other professionals and the general public.

The following activities have been completed thus far on the fire advocacy initiative:

- At our request, the Fairbanks Area Biologist made a presentation to the Fairbanks and Middle Nenana River Fish and Game advisory committees concerning the need for habitat enhancement on the Tanana Flats and the status of the Western Tanana Flats Prescribed Burn Plan.
- We went on KFAR radio on 2 occasions to talk about the plans for prescribed burning on the western Tanana Flats and answer questions from listeners.
- A fire poster was displayed and leaflets made available during the Outdoor Show at the Carlson Center in Fairbanks.
- Short articles were submitted to the Fairbanks Chamber of Commerce, the Fairbanks Convention and Visitor's Bureau, and the Northern Alaska Environmental Center for inclusion in those organization's newsletters.
- Slide presentations were made to the Clear Sky Sportsman's Association, the Natural Resources Committee of Fairbanks Chamber of Commerce, the Fairbanks chapter of the Sierra Club, the Alaska Outdoor Council, Safari Club International, the Fairbanks Chamber of Commerce, and the Tanana Valley Sportsmen's Association.

We presented a talk on forest wildlife management at a continuing education workshop of Yukon River Chapter of the Society of American Foresters in Fairbanks and a lunchtime seminar on aspen management for a monthly meeting of the Chapter.

We attended the 3rd North American Forest Ecology Workshop in Duluth, Minnesota.

We gave presentations on boreal forest succession and disturbance to local schools and undergraduate classes at the University of Alaska Fairbanks.

A poster and handouts were prepared on aspen treatment projects for the annual banquet of the Interior Alaska Chapter of the RGS.

A FY00 Federal Aid Research Performance Report and a FY02 budget request and work plan were submitted.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None.

IV. RECOMMENDATIONS FOR THIS PROJECT

Although felling treatments almost always produce aspen stem densities exceeding the minimum objective, the volume and vertical extent of aspen debris resulting from mechanical treatments does not emulate natural debris recruitment in boreal forest. Our concern is that this amount of debris may remain for prolonged periods, compromising suitability as brood habitat by ruffed grouse by hindering chick movement and providing cover for terrestrial mustelids that prey on grouse. After autumn 2001, we will suspend mechanical treatments in aspen that do not incorporate some type of debris windrowing while continuing to evaluate debris effects on stem density over time.

Spring burns in standing aspen continue to produce higher sucker densities than obtained through mechanical treatments, without resulting in a lot of debris on the ground in the short-term. This alternative to felling continues to become more cost-effective as DOF fire staff gain experience in prescribed burning. We will attempt to increase the number of units burned annually, beginning in spring 2002, to aid in the evaluation of the long-term efficacy of prescribed burning as an alternative to mechanical treatments.

Grouse populations are currently at a cyclic low in abundance in Interior Alaska. When grouse populations begin to rebound, we intend to evaluate the feasibility of a study to determine whether aspen felling debris hinders chick movement or increases predation rates. This study would likely involve estimating hen habitat selection, chick survival, and cause-specific mortality of grouse among the various treatments at Nenana Ridge.

Progress in evaluating techniques for habitat enhancement and restoration is inherently limited by the relatively slow processes in forest succession, particularly in boreal regions. To date our applied research has focused on establishing long-term monitoring plots. The complementary approach is to also conduct retrospective studies of how past forestry practices or wildland fires have influenced the present structure and composition of forests as wildlife habitat. In summer 2002, we hope to provide a volunteer internship to a UAF graduate student through a new interdisciplinary training program funded by a National Science Foundation grant to a UAF faculty member. Our intent is to collaborate with faculty and state foresters to conduct retrospective studies of past timber sales in the Tanana Valley.

Some members of society perceive that habitat management ostensibly to benefit a single game species (e.g., aspen treatments for ruffed grouse) is inappropriate because of potential harm to other species. We requested that the Alaska Bird Observatory estimate the costs of conducting a breeding survey for passerine birds in the Nenana Ridge project area to

document songbird use of our aspen treatments, recent sales of birch for firewood, and the mixture of mature forest species that have regenerated from natural processes in the area. We will work with the RGS to secure funding for the passerine survey.

We have found that a large effort is required to obtain even moderate survival of feltleaf willow planted in upland clearcuts. Planting is worth considering as a restorative effort on a case-by-case basis, but appears too expensive for the return obtained to advocate as a routine management treatment in these dry upland sites. We will continue to monitor the existing demonstration plots, but do not plan to extend the planting effort at this time.

V. PUBLICATIONS

BOWYER RT, BM PIERCE, LK DUFFY, AND DA HAGGSTROM. 2001. Sexual segregation in moose: effects of habitat manipulation. *Alces* 37: In press.

VI. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

Total project costs during this period were \$127,179.16, including all personnel and operating costs.

VII. PREPARED BY:

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